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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,340	07/30/2001	Jae-Hak Kim	4591-183	2739

7590 10/06/2003
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EXAMINER

ERDEM, FAZLI

ART UNIT PAPER NUMBER

2826

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/919,340

Applicant(s)

KIM ET AL.

Examiner

Fazli Erdem

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's communication filed on 08/08/2003 has been carefully considered by the examiner. The arguments advanced therein are persuasive with respect to the rejections of record and those rejections are accordingly withdrawn. In view of a further search, however, a new rejection is set forth further below. This action is not made final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6 and 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (6,051,508) in view of Wang et al. (6,287,955) further in view of Seta et al. (6,352,931) further in view of Chen et al. (6,482,748).

Regarding Claim 6, in Figs. 3A-3G, Takase et al show all the claimed subject matter including the deposition of organic and inorganic oxide layers on a substrate and forming trench with HF etching. Takase et al. fail to explain the low dielectric constant properties of the oxide layers and fail to disclose the trench formation in detail. However, Wang et al. show a fabrication method of integrated circuits with multiple low dielectric-constant intermetal dielectrics where the etching of trench and explanation of low dielectric properties of the insulating layers explained. It would have been obvious to one of having ordinary skill in the art

at the time the invention was made to include the required oxide layer formation with low dielectric constant and trench formation in Takase et al. as taught by Wang et al. in order to manufacture a semiconductor device with higher performance.

Takase et al. and Wang combination fail to disclose the required organic structure. However, Seta et al. disclose a manufacturing method of semiconductor devices by using dry etching technology where the application of structure is disclosed. It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required organic structure in Takase et al. and Wang et al. as taught by Seta et al. in order to make a semiconductor device with better insulation.

Takase et al., Wang et al, and Seta et al. combination fail to disclose the required BOE etching with time requirement. However, Chen et al. disclose a poly gate silicide inspection by back end etching where the required etching type and time structure is disclosed. It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required etching type and time structure in Takase et al., Wang et al., and Seta et al. as taught by Chen et al., in order to make a semiconductor device with higher performance.

Regarding Claim 2, Takase et al., Wang et al., and Chen et al. combination do not teach the application of organic silicon dioxide layer. However, Seta et al. disclose a manufacturing method of semiconductor devices by using dry etching technology where the application of organic silicon dioxide layer is disclosed.

Regarding Claims 3 and 4, Takase et al., Seta et al. and Chen et al. combination do not teach the resist and contact formation. However, step-by-step in figures of 2-5, Wang et al. show the formation of resist processing and formation of contact hole.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (6,051,508) in view of Wang et al. (6,287,955) further in view of Seta et al. (6,352,931) further in view of Chen et al. (6,482,748) further in view of Takeishi (6,370,048).

In combination Takase et al., Wang et al., Seta et al. and Chen et al. disclose all the claimed subject matter except they fail to specify the thickness of the organic insulating film. However, in Fig. 1A, Takeishi discloses the thickness of the organic insulating film 4 to be between 0.05- 2.0 microns.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required organic insulating film thickness in Takase et al., Wang et al., Seta et al., and Chen et al. as taught by Takeishi et al. in order to make a semiconductor device with higher reliability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (703) 305-3868. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

FE


Minhloan Tran
Primary Examiner
Art Unit 2826